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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,623	02/10/2004	John David Adamson	P50-0080	1546

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EXAMINER	
MAKI, STEVEN D	
ART UNIT	**PAPER NUMBER**
1733	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/775,623	ADAMSON ET AL.	
	Examiner	Art Unit	
	Steven D. Maki	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-13,15-21 and 23-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-13,15-21,23-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1) The drawings are objected to because the response filed 11-6-06 amended the specification to recite antenna 20 and bead 12 whereas the amendment to the drawing filed 4-19-06 uses 12 to indicate the antenna and 20 to indicate the bead. With respect to the amendment to the specification filed 11-6-06, the changes should be identified by appropriate underlining and/or bracketing.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2) The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3) Claims 1-5, 7-13 and 15-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claims 1, 10 and 20, the subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention (i.e. the new matter) is "a radio device which operates at a frequency of 31-300 or greater than 500 MHz". The original disclosure (e.g. original claim 10) describes a radio frequency device which operates at a frequency of "at least 130 MHz" instead of a frequency of "31-300 or greater than 500 MHz". The original disclosure fails to reasonably convey using a frequency of "31-300 or greater than 500 MHz". The original specification fails to teach using a lower limit of 31 MHz. The original specification fails to teach using "31-300 MHz" as an alternative to "greater than 500 MHz".

4) The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5) Claims 21 and 23-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 21, the limitation of utilizing a radio frequency antenna with a tire is unclear and as such it is unclear if claim 21 requires embedding the antenna in a tire and/or elastomeric material. The preamble indicates that the former is required whereas the body of the claim does not appear to require embedding the antenna in a tire. In other words, the claimed association of the antenna and tire is unclear.

6) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7) **Claims 1-5, 7, 9-13, 15-16, 18-21, 23-25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mock et al (US 6,062,072) in view of Kenison et al (US 2002/0133942), Parylene Properties / Characteristics and Crawford et al (US 6,044,882).**

Mock et al discloses a tire having a radio frequency device wherein the radio frequency device comprises a transmitter and an antenna which is in electrical contact with the transmitter. Mock et al teaches that the frequency of the electromagnetic carrier waves is between 4 and 100 kilohertz. Mock et al also describes that a high frequency such as 400-500 MHz may be used for the signal transmission. See col. 3 lines 53-58. The antenna is vulcanized in the tire sidewall or the tread (e.g. col. 1 lines 59-61, col. 10 lines 1-8) and is therefore embedded in rubber. The antenna is comprised of an "electrically insulated wire". See col. 5 lines 36-45. Alternatively, electrical insulation is not required when the tire material posses a corresponding

electrical resistance value. See col. 5 lines 36-45. The claimed electronic device / radio frequency device corresponds to Mock et al's radio frequency device. One of ordinary skill in the art would readily understand that "electrically insulated wire" means a wire surrounded by an insulating coating. Mock et al does not specifically recite the electrically insulating material as having the specified properties.

As to claim 1, it would have been obvious to one of ordinary skill in the art to provide Mock et al's antenna such that it surrounded by electrically insulating material having the specified properties (dielectric constant less than that of the rubber, e.g. less than 3), surface resistivity of at least 10^{12} ohm/sq, a volume resistivity of at least 10^{9} ohmxcm, and dissipation factor less than 0.03) since:

(1) Mock et al teaches **using electrically insulated wire for the antenna** (col. 5 lines 40-41) and vulcanizing the antenna in the rubber tread or rubber sidewall of the tire;

(2) Kenison et al suggests using parylene as **the electrically insulating coating material for wire forming an antenna** (paragraph 89);

(3) Parylene Properties / Characteristics teaches using parylene as a coating on wire and describes Parylene N as having the following properties:

- dielectric constant of 2.65,
- surface resistivity of 10^{15} ohm-cm,
- volume resistivity of $1x10^{17}$ ohm-cm, and
- dissipation factor of 0.0002; and

(4) it is well known in the tire art as evidenced by Crawford et al that conventional tires comprise carbon black reinforced rubber such that **the conventional carbon black reinforced rubber tire is electrically conductive** so that the build up of static charge on moving vehicles can be discharged to the ground through the tire (col. 1 lines 46-62, col. 2 lines 12-22, lines 64-67, col. 3 lines 1-29).

Hence, Mock et al teaches a first embodiment including using an electrically insulated wire as the antenna and embedding the insulated wire in rubber of the sidewall or tread. As to a suitable electrically insulating material, Kenison et al and Parylene Properties / Characteristics suggest using parylene as electrically insulating material for a wire. Kenison et al recommends parylene as electrically insulating material for a wire forming an antenna. Parylene Properties / Characteristics also suggests using parylene as electrically insulating material for a wire and, with respect to electrical breakdown, notes that parylene has extremely high dielectric strength. The claimed insulating coating having the specified properties in claim 1 reads on parylene. For example, Parylene N has a dielectric constant, surface resistivity, volume resistivity and dissipation factor falling within the respective claimed ranges of claim 1. Parylene has a dielectric constant less than that of the conventional carbon black reinforced rubber described by Crawford et al since parylene is electrically insulating whereas carbon black reinforced rubber is electrically conductive as is well known to one of ordinary skill in the tire art.

As to claims 1, 10 and 20, it would have been obvious to one of ordinary skill in the art to use a radio device which operates at a frequency of "31-300 or greater than

500 MHz" in Mock et al's tire since Mock et al teaches "It is also possible, and within the teaching of the present invention, to use a high frequency signal for the signal transmission, for example, in the industrial frequency band from several hundred MHz, for example in the range of 400 to 500 MHz" (col. 3 lines 53-58, emphasis added). This disclosure of Mock fairly suggests using a frequency of greater than 500 Mhz. The specifically described range of "400 to 500 Mhz" is merely exemplary.

As to claims 2-4, the claimed coating thickness of at least 0.02 mm thick (claim 2) / at least 0.1 mm thick (claim 3) / at least 0.015 mm thick (claim 4) for the insulating coating would have been obvious and could have been determined without undue experimentation in view of Mock et al's teaching to use electrically insulated wire; this being especially true in view of Mock et al's alternate embodiment in which wires of the antenna are embedded in an electrically insulating foam body 61 having a thickness for example of several millimeters (col. 11 lines 6-24).

As to claim 4 (coating is formed of parylene), Kenison et al and Parylene Properties / Characteristics suggest using parylene as electrically insulating material.

As to claim 5, Parylene N has a dielectric constant of 2.65, falling within the claimed range of less than 3.

As to claim 7 (coating material is ... parylene), Kenison et al and Parylene Properties / Characteristics suggest using parylene as electrically insulating material.

As to claim 9, note Mock et al's teaching to embed the antenna in rubber of the tire sidewall.

As to claim 10, it would have been obvious to one of ordinary skill in the art to provide Mock et al's tire with carcass reinforcement and carbon black reinforced rubber material layers (e.g. sidewalls) since such tire components are conventionally used in a pneumatic tire as evidenced by Crawford et al. The insulating coating in claim 10 reads on parylene. As to the properties of the insulating material, attention is again directed to the properties of parylene described in Parylene Properties / Characteristics.

As to claims 11 and 12, the claimed coating thickness of at least 0.02 mm thick (claim 11) / at least 0.1 mm thick (claim 12) for the insulating coating would have been obvious and could have been determined without undue experimentation in view of Mock et al's teaching to use electrically insulated wire; this being especially true in view of Mock et al's alternate embodiment in which wires of the antenna are embedded in an electrically insulating foam body 61 having a thickness for example of several millimeters (col. 11 lines 6-24).

As to claim 13, Parylene N has a dielectric constant of 2.65, falling within the claimed range of less than 3.

As to claim 15 (coating material is ... parylene), Kenison et al and Parylene Properties / Characteristics suggest using parylene as electrically insulating material.

As to claim 16, Kenison et al and Parylene Properties / Characteristics suggest using parylene as electrically insulating material. Furthermore, the claimed coating thickness of at least 0.015 mm thick for the insulating coating would have been obvious and could have been determined without undue experimentation in view of Mock et al's teaching to use electrically insulated wire; this being especially true in view of Mock et

al's alternate embodiment in which wires of the antenna are embedded in an electrically insulating foam body 61 having a thickness for example of several millimeters (col. 11 lines 6-24).

As to claim 18, note Mock et al's teaching to embed the antenna in rubber of the tire sidewall.

As to claim 21, Mock et al discloses a method of embedding a radio frequency antenna in a tire comprising embedding an electrically insulated wire in elastomeric material of a tire component such as a sidewall. The claimed coating reads on parylene. The coating step is suggested by Mock et al's teaching to use electrically insulated wire. Also see paragraph 89 of Kenison et al.

As to claim 23, the claimed coating thickness of at least 0.1 mm thick for the insulating coating would have been obvious and could have been determined without undue experimentation in view of Mock et al's teaching to use electrically insulated wire; this being especially true in view of Mock et al's alternate embodiment in which wires of the antenna are embedded in an electrically insulating foam body 61 having a thickness for example of several millimeters (col. 11 lines 6-24).

As to claim 24, (coating material is ... parylene), Kenison et al and Parylene Properties / Characteristics suggest using parylene as electrically insulating material.

As to claim 25, Mock et al teaches using a dipole antenna in a tire for a desired high frequency signal (col. 3 lines 53-61).

As to claim 27, note Mock et al's teaching to embed the antenna in rubber of the tire sidewall.

As to claims 19 and 20, it would have been obvious to one of ordinary skill in the art to embed the antenna in the silica reinforced tread of Crawford et al whereby the dielectric constant of the silica reinforced tread is less than a dielectric constant of the rubber material layers (e.g. conductive carbon black reinforced rubber layers) since Mock et al teaches embedding the antenna in the tread and notes that electrical insulation does not need to be applied to the antenna if the tire material has the desired electrical resistance value (col. 5 lines 36-45). The claimed "insulating coating ...wherein the coating is formed by a rubber material layer of the tire" (claim 19) or "a rubber material in which the antenna is embedded has a dielectric constant less than 3 ..." (claim 20) reads on a silica reinforced tread as disclosed by Crawford et al. Furthermore, it would have been obvious to provide such a silica reinforced rubber tread having the embedded antenna with the claimed properties since (1) Mock et al teaches embedding the antenna in the tread and notes that electrical insulation does not need to be applied to the antenna if the tire material has the desired electrical resistance value (col. 5 lines 36-45), (2) Crawford et al teaches that the silica reinforced rubber tread is electrically insulating and (3) well known / conventional electrically insulating material for antennas includes parylene which has properties such as:

- dielectric constant of 2.65,
- surface resistivity of 10^{15} ohm-cm,
- volume resistivity of $1x10^{17}$ ohm-cm, and
- dissipation factor of 0.0002

as evidenced by Parylene Properties / Characteristics.

In summary, Mock et al teaches a radio device which operates at a frequency within the claimed range of at least 130 MHz and an antenna. Mock et al teaches embedding the antenna in rubber such as for example the rubber of the sidewall of the tire or the rubber of the tread of the tire. Mock et al teaches surrounding the antenna with electrically insulating material wherein this electrically insulating material may be an electrically insulating coating on the wire forming the antenna or it may be the rubber of the tire itself. The claimed properties are the desired properties for electrically insulating material surrounding a wire forming an antenna in view of Kenison's teaching to coat an antenna with parylene and Parylene Properties / Characteristics' disclosure of properties of parylene.

8) **Claims 8, 17 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mock et al (US 6062072) in view of Kenison et al (US 2002/0133942), Parylene Properties / Characteristics and Crawford et al (US 6044882) as applied above and further in view of Bohm et al (US 6,388,567), Wilson (US 6,192,746) or Pollack et al (WO 01/36220).**

As to claims 8, 17 and 26, it would have been obvious to use a patch as claimed in order to integrate Mock et al's antenna with the tire since (1) Mock et al suggests adhering the antenna onto the tire (col. 1 lines 62-65) and (2) Bohm et al suggests embedding an antenna in a patch which adheres to the innerliner; Wilson suggests embedding an electronic monitoring package having an antenna in an anchoring layer, which is connected to the innerliner; or Pollack et al suggests joining an antenna to a tire using a rubber patch which may be conductive (e.g. page 50).

9) **Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mock et al (US 6062072) in view of Kenison et al (US 2002/0133942) and Parylene Properties / Characteristics and Crawford et al (US 6044882) as applied above and further in view of Forster et al (US 6630910).**

As to claim 25, it would have been obvious to one of ordinary skill in the art to tune Mock et al's dipole antenna as claimed since (1) Mock et al teaches that the antenna may be wave shaped (figure 14) and (2) Forster et al, also directed to a radio frequency device for a tire, suggests designing an antenna such that the length of the wave shaped antenna only reaches a certain *designed length* to be capable of receiving signals at the operating frequency of the interrogation reader when the tire reaches a certain threshold pressure (col. 11 lines 1-5).

Remarks

10) Applicant's arguments filed 11-6-06 have been fully considered but they are not persuasive.

Applicant argues that the reference to "high frequency" in Mock is confusing. This argument is not persuasive because (1) Mock et al's description of "industrial frequency band" is not confusing, (2) Mock et al's description of "from several hundred MHz" is not confusing and (3) Mock et al's description of "for example in the range of 400 to 500 MHz" is not confusing.

Applicant argues that the frequency range of 31-300 and greater than 500 MegaHertz do not touch any of the ranges of Mock et al. This argument is not persuasive since (1) Mock et al's disclosure at col. 3 lines 53-58 fairly suggests using a

frequency of greater than 500 Mhz and (2) the specifically described range of "400 to 500 Mhz" is merely exemplary.

With respect to the properties of the insulating material, applicant states "Neither Kenison nor Parylene provide such motivation". No reasons are given by applicant for this conclusion. Kenison et al and Parylene Properties / Characteristics provide ample suggestion to use parylene as the electrically insulating material for the wire of Mock et al's antenna; it being noted that Mock et al discloses using electrically insulated wire as the antenna and parylene has the claimed properties.

With respect to claim 20, applicant argues that Crawford et al does not provide motivation for the use of the insulating material with the specific properties. This argument is not persuasive since (1) Mock et al suggests locating the antenna in a tire tread and motivates one of ordinary skill in the art to provide insulating material around the wire of the antenna and (2) Crawford et al teaches that silica reinforced tire treads are electrically insulating. With respect to desirable properties for electrically insulating material, see Parylene Properties / Characteristics.

11) No claim is allowed.

12) Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

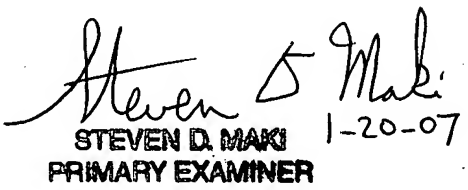
TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven D. Maki
January 20, 2007



STEVEN D. MAKI
PRIMARY EXAMINER